



# Review of Program Evaluation Report DCAS-PER-039

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# DCAS-PER-039 (“PER-039”) purpose

Address the impacts of issuing revision 01 of DCAS-TKBS-0005, the technical basis document (TBD) for Baker-Perkins, on previously completed cases

# Baker-Perkins background

- ◆ Developed industrial mixing machines initially intended for the food industry, but later transitioned to chemical industry processing
- ◆ Baker-Perkins produced a line of continuous heavy-duty mixers called the “Ko-Kneader”
  - In 1956, this line of mixer was tested for its use in mixing uranium compounds for National Lead of Ohio (Fernald)
    - Tests performed from May 14 through 16, 1956, at Baker-Perkins in Saginaw, Michigan
    - Equipment used in the tests was decontaminated and cleaned from May 15 through 18, 1956

# Baker-Perkins timeline

- ◆ Energy Employees Occupational Illness Compensation Program Act of 2000 covered period from May 14 through 18, 1956
- ◆ No residual period, as all equipment was decontaminated and cleaned after the tests

# Subtask 1: Changes necessitating program evaluation report (PER)

- ◆ SC&A [reviewed revision 00 of the TBD in 2011](#)
  - Review had four findings and six observations
- ◆ Revision 01 of the TBD issued on May 1, 2012

## Subtask 2: Assess corrective action methods

- ◆ Changes in dose reconstruction methods for Baker-Perkins were incorporated into revision 01 of the TBD, resulting in increased inhalation doses
- ◆ SC&A has previously reviewed revision 00 of the TBD
- ◆ Therefore, SC&A's subtask 2 review of PER-039 is primarily a review of the changes made in revision 01 of the TBD

# Occupational internal dose estimate

- ◆ Internal dose estimate uses alpha air samples (breathing zone and general air) collected during all phases of testing
- ◆ Main change in revision 01 of TBD is the condensing of four former job categories into three categories
  - Operator, laborer, supervisor, and clerical to operator/laborer, supervisor, and other
- ◆ More detailed timeline of test was used to calculate doses

# Occupational internal dose estimate – Job categories

- ◆ Operator/laborer category designated for workers involved with hands-on tasks
  - Used breathing zone (BZ) air samples to calculate dose for this category
- ◆ Supervisor category designated for workers who were likely in the vicinity of the activities but not hands-on
  - Used general air (GA) air samples to calculate dose for this category
- ◆ Other category designated for workers who would not have routinely been in the area during the test but could have entered infrequently
  - Assigned 10% of the supervisor dose
- ◆ The National Institute for Occupational Safety and Health (NIOSH) calculated uranium inhalation and ingestion intake rates for each category

# SC&A comments on internal dose

- ◆ SC&A's 2011 TBD review had 2 findings associated with internal dose estimates:
  - Finding 1: Air concentration assignments may not have been claimant favorable or bounding
  - Finding 2: The use of the 50th percentile values is not adequate
- ◆ NIOSH responded to these findings in a white paper
- ◆ SC&A's response to NIOSH's white paper found that NIOSH adequately addressed the original concerns
- ◆ SC&A confirmed that the methods detailed in the white paper were incorporated into revision 01 of the TBD
- ◆ SC&A also confirmed that the resulting internal dose estimates were higher for all job categories
- ◆ SC&A has no findings or observations on internal dose

# Occupational external dose estimate

- ◆ No external dose readings collected during the testing
- ◆ Highest exposure potential from drummed uranium
- ◆ NIOSH calculated external dose assuming workers were 1 foot away from a 55-gallon drum of uranium-238 for entire day
- ◆ All worker categories receive the same external dose estimate
- ◆ TBD table 5 contains calculated external photon dose, skin dose, dose to the hands and forearms

# SC&A comments on occupational external dose

- ◆ SC&A's 2011 TBD review had 2 findings and 1 observation associated with external dose estimates:
  - Finding 1: No submersion dose considered
  - Finding 2: Two drums of uranium not considered
  - Observation: Inconsistency with the defined labor categories between internal and external dose estimates
- ◆ NIOSH responded with a white paper, which stated dose from a drum of uranium was more claimant-favorable than surface contamination
- ◆ NIOSH determined the amount of uranium used in the tests could have fit into a single drum
- ◆ No changes were made to the assigned doses from revision 00, but clarifying language was added
- ◆ SC&A has no findings or observations for external dose

# Occupational medical dose

- ◆ No site-specific guidance for Baker-Perkins occupational medical dose
- ◆ Use ORAUT-OTIB-0006, rev. 03 PC-1 to assign occupational medical dose
  - Assumed one chest x-ray for 1956
- ◆ SC&A agrees with the TBD guidance of using ORAUT-OTIB-0006 in the absence of site-specific information, and the assumed examination frequency

# Subtask 3: PER selection criteria for determining dose reconstructions requiring a rework

- ◆ All completed claims with verified employment at Baker-Perkins with a probability of causation (POC) less than 50%
  - 8 claims
- ◆ All 8 claims reevaluated using revision 01 of DCAS-TKBS-0005
  - All 8 claims had POC below 45%
    - Highest POC below 15%
    - POC increased for 3 claims and decreased for remaining 5 claims
- ◆ SC&A agrees with NIOSH's selection criteria and that it is broad enough to capture all potentially affected claims
- ◆ PER was conducted in a timely manner
  - DCAS-TKBS-0005, rev. 01, issued in May 2012, PER-039 issued in January 2013
- ◆ SC&A has no findings or observations for subtask 3

## Subtask 4: Audit of reevaluated dose reconstructions

SC&A recommends that the Advisory Board on Radiation and Worker Health select one of the cases evaluated by NIOSH whose POC increased and one of the cases whose POC decreased



# Questions?